



HAND DELIVERED

January 24, 2013

Mr. Doug Wheeler
Chairman
Planning & Zoning Commission
City of Columbia

RE: Parkside Estates, Case No. 12-185

Dear Chairman Wheeler:

On behalf of the Missouri Department of Natural Resources, Division of State Parks, I have attached brief technical comments to the above proposal.

The planned subdivision is not in the best interest of Rock Bridge Memorial State Park. Since its inception in 1967, the park has been visited by millions and helped foster a way of life in the surrounding area. Today, the park is an invaluable landmark that draws people to the area and the great outdoors for recreation, education, reflection, and family fun. The planned subdivision will change the experiences that people enjoy when they visit the park, and that will be a loss to the park, its visitors, and this community.

On a purely economic level, the state has spent more than \$5.5 million operating and improving the park since 1985. This is a significant investment in your community and in the lives of countless everyday Missourians. Consequently, we appreciate deeply the overwhelming support that the community has given the park throughout this process.

Please accept our comments and help us protect Rock Bridge State Park for future generations.

Sincerely,

MISSOURI STATE PARKS

William J. Bryan
Director

Parkside Estates Development Rock Bridge State Park Concerns

Groundwater

- The eastern tributary through the property is a losing stream
 - Concern: Surface runoff, including contaminants, could enter the groundwater and impair subsurface water quality immediately downstream in the park.
 - Concern: Two springs are located along this losing stream below Parkside Estates. Water quality at these springs could be at risk if surface contaminants enter the groundwater on the property.
 - Concern: Water flow through these springs could be at risk if surface water is held or diverted into a different waterway.
- The western tributary through Parkside Estates is likely a losing stream, as it contains the same geologic setting and shares proximity with the eastern tributary.
 - Concern: Any threat to surface water or groundwater quality and quantity associated with the eastern tributary, likely exists for the western tributary as well.

Surface Water

All surface runoff from Parkside Estates will drain downhill immediately into the park. We recommend stormwater management decisions be made in the design phase and that the permittee consider environmentally friendly design techniques.

- Concern: Many hikers enjoy the trail that traverses the west side of the park, alternately following or crossing the two tributaries that enter the State Park from Parkside Estates. Any significant change in surface water quality and quantity, including sediment during construction, would affect park users and the value of this trail. If erosion increases, trails along the two tributaries are likely to need increased maintenance.
- Concern: If storm water runoff should increase, stream bank erosion and loss of trees and aquatic habitat would become a concern in the park.
- Concern: The park protects wetland and aquatic natural resources downstream of Parkside Estates, and changes in water quantity and quality would impact plant or animal life associated with them. Six tenths of a mile of Little Bonne Femme Creek, currently with good ratings on water chemistry and macro-invertebrates, could be at risk
- Concern: If the Bonne Femme Watershed Plan, adopted by the City of Columbia, is to continue to be a guide for governments and developers and be effective at protecting sensitive watershed resources, then it should definitely be reviewed and its recommendations followed in this case.
- Concern: Stream bank erosion is particularly harmful for buried archaeological sites. The park has a number of previously-recorded archaeological sites that are located along the Little Bonne Femme, and it is likely that there are additional undiscovered

archaeological sites there, any of which could be affected by erosion if storm water discharge changes.

Drainage Characteristics of Soils and Bedrock on Parkside Estates

The Mississippian-aged bedrock in this vicinity has a high permeability and would be hard to seal and prevent water from moving into the groundwater system. Typically the bedrock is covered by only 15 to 35 inches of clay, which is not sufficient to excavate a large dam and core for a detention pond, and would be easily breached during excavation to expose the permeable bedrock to runoff from Parkside Estates. We do not recommend an in-channel detention pond, and if planned note that it will require compensatory stream mitigation.

- Concern: The Pre-Design Plans' detention pond seems to overlie soils of the Bayless-Reuter complex, which are easily drained soils that are not well suited for water retention.
- Concern: We expect that the areas designated for turfgrass swales, bioretention structures or native preservation also overlie moderately to easily drained soils that are not well suited for water retention. The BMP guidance document that was cited in the letter indicates that each bioretention structure should have a drainage area no more than 4 acres. The drainage area for the shown detention basin is about four times the recommended maximum. So it is unclear how or where the bioretention structures would be used, or that they would be sufficient to prevent contaminated discharge into the park's surface and groundwater.

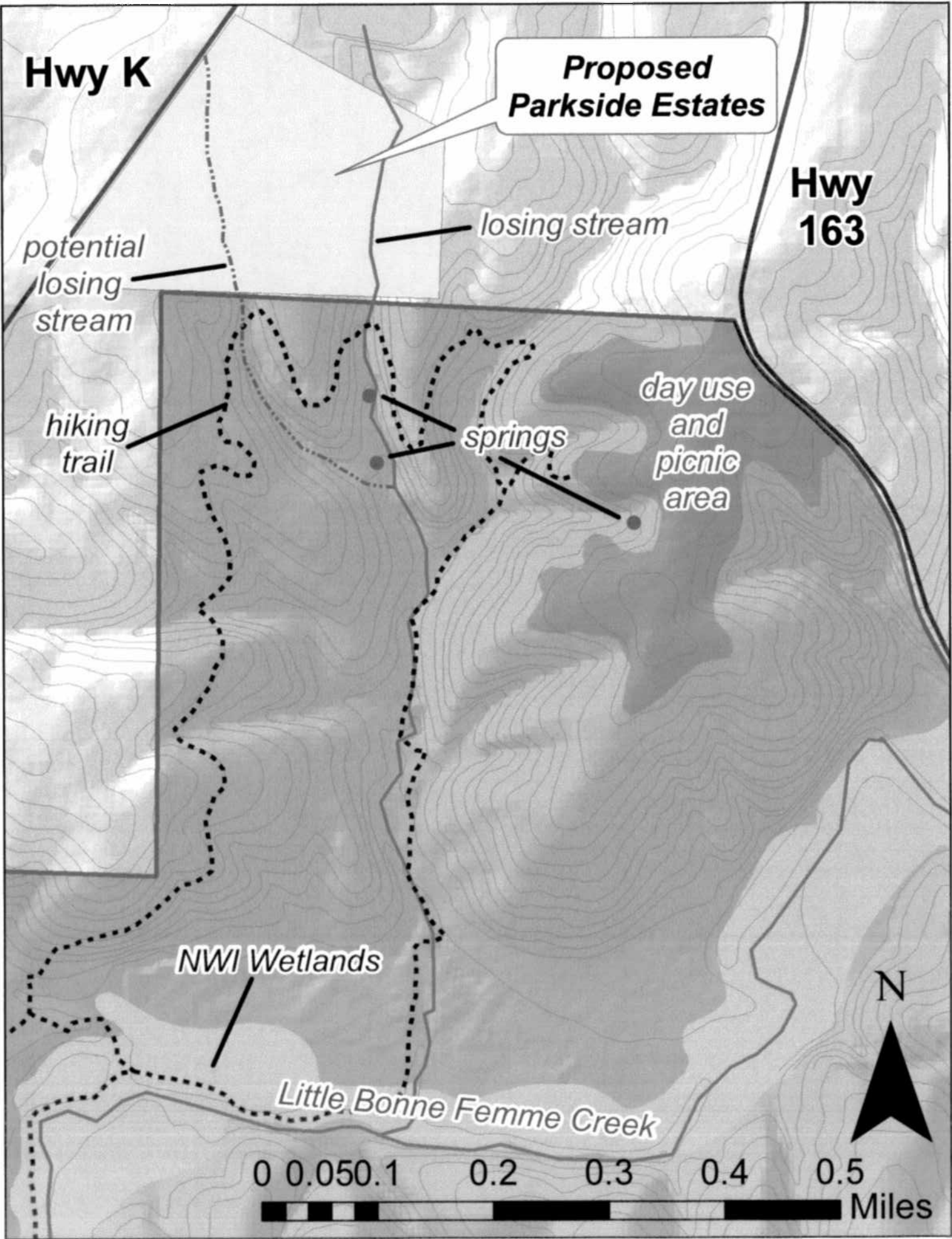
Park Operations and Visitor Use

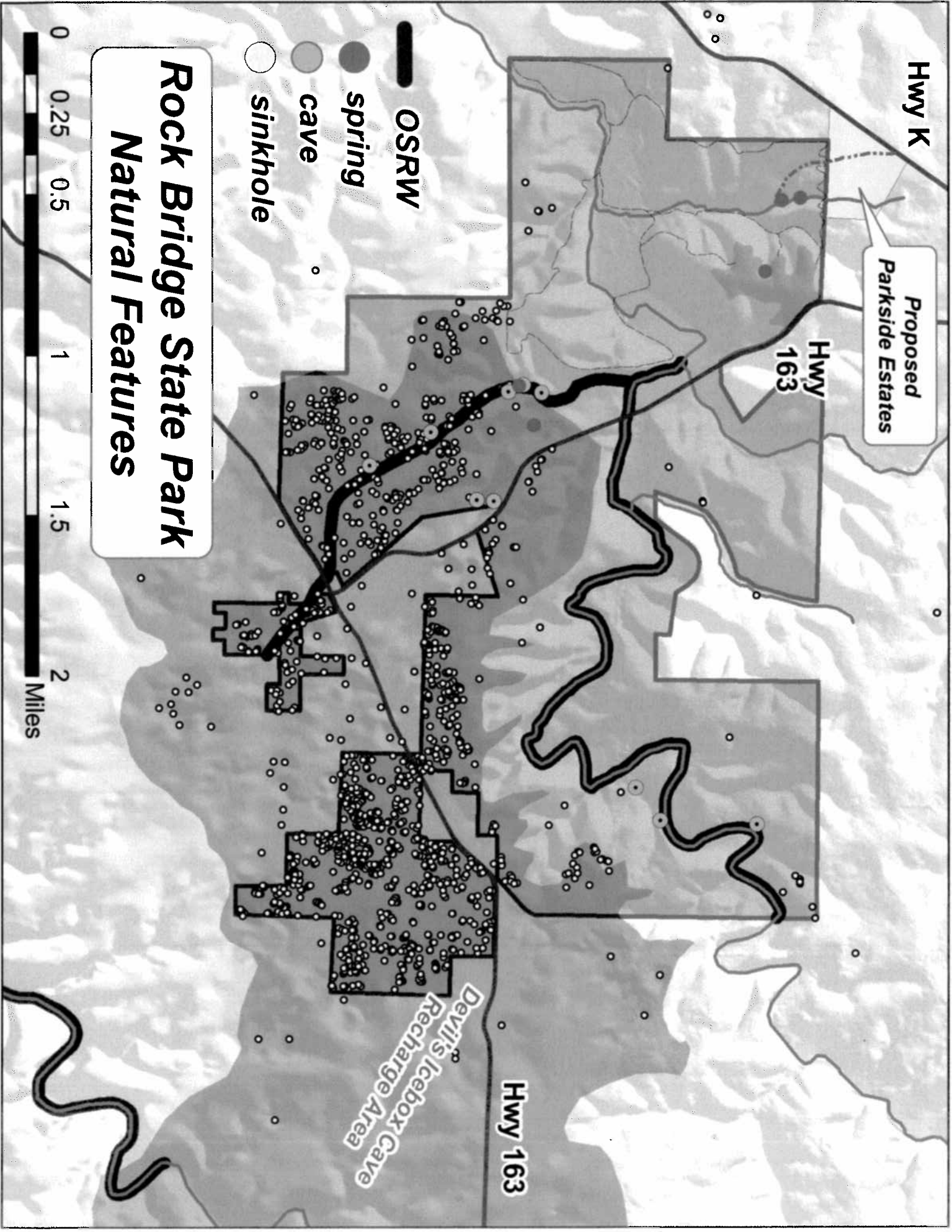
The housing development immediately borders the state park, and could become the densest urban development to share a boundary with a Missouri State Park.

- Concern: The Park's main day use area, with picnic grounds, shelters and playgrounds, begins less than one-quarter mile away. Sights and sounds from Parkside Estates will impinge on this day use area and its many visitors.
- Concern: The Deer Run Trail system which originates from this day use area and with a spur from Rock Bridge Elementary School, is very popular with hikers, bikers and joggers. It follows the entire south edge of the proposed development, and features the two streams which drain from Parkside Estates. Sounds, and wind- and waterborne trash, especially down through the two creeks into the park, would become a significant problem for park managers and trail users. With the development as planned, we expect that the Deer Run Trail will no longer be a quiet path through a forest. Lights at night will disrupt normal wildlife behavior.
- Concern: Invasive exotic ornamental plants are a serious and expensive concern for the state park. Many common landscape plants are problems in natural environments, and with such dense housing this will become an ecological and financial liability for the state park.
- Concern: This part of Columbia and the state park has suffered from overpopulations of deer, and continued urban growth into this area will favor high deer numbers. The ability of the state park to help manage these deer numbers will diminish when housing

developments are placed on the park border, because safety concerns will preclude adjacent sections of the park from being included in managed hunts.

- Concern: Rock Bridge State Park provides Columbia residents with a scenic and popular outdoor recreation destination. Its main value and distinction is its natural forests and streams which are enjoyed in many ways by many people, year around. High density urban development on its very borders will significantly impact those values and uses.





Hwy K

Proposed
Parkside Estates

Hwy
163

Hwy 163

Devil's Icebox Cave
Recharge Area

— OSRW

● spring

● cave

○ sinkhole

**Rock Bridge State Park
Natural Features**

0 0.25 0.5 1 1.5 2 Miles

Challenge of the '90s Our Threatened State Parks



Missouri Department of Natural Resources

ness; more than 90 percent of Missouri's native plant species; 340 populations or recorded occurrences of rare, endangered, or watchlisted species; numerous plant species that are relicts deposited in Missouri and surviving from the last ice age; 118 endemic plants and animals whose worldwide distribution is the Ozarks; and several species whose only location in the world is in one of Missouri's state parks. They also include cultural properties representing Missouri's significant themes in prehistory and history, including the territorial period, the Civil War, black history, art, literature, and Missouri's ethnic heritage.

Very few lands around state parks remotely resemble the wild settings of their original boundaries. And many of us have watched the scenic, natural, historic, and recreational value diminish within them. The link between the changing boundaries and diminishing values is compounded by visitor numbers that grow every year. Unfortunately, depreciation can only increase with time because development and change will undeniably become more complete around park borders. Park values will continue to be pushed, often subtly and unheralded, toward thresholds of irretrievable loss. Who knows how many thresholds have already been crossed?

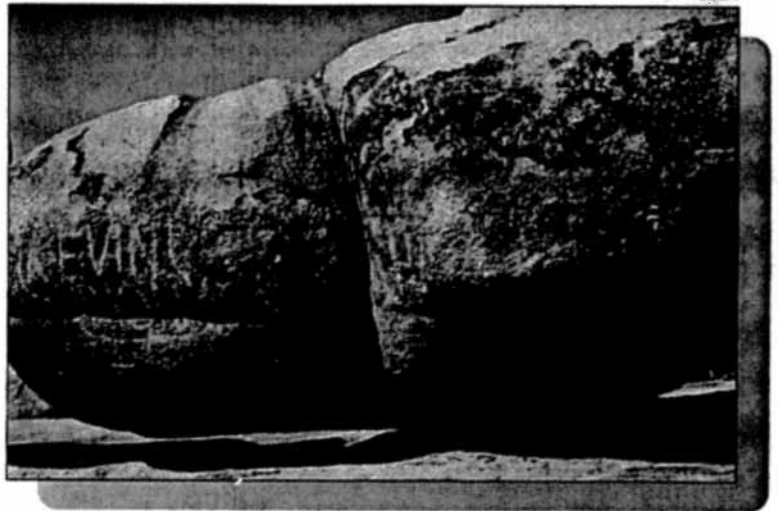
The positive side to this is that Missouri is very fortunate and almost unique among America's park systems to have a dedicated source of funds for their care. Since the parks-and-soils sales tax was passed in 1984, the Department of Natural Resources has been able to resolve a serious backlog of critical operating problems. Roads have been repaired, buildings rebuilt and replaced, and campgrounds renovated. Many improvements have been made, with new cabins, amphitheaters, visitor centers, picnic shelters, swimming beaches, modern shower houses, and scenic boardwalks ready to use. Money has been spent landscaping park facilities and hiring people to keep the grass mowed and buildings in good repair. Essentially, the park system has been rebuilt. It has even made progress in providing new amenities and visitor services.

But while all this was happening, sewage leaked from a municipal treatment plant into underground conduits leading to Ha Ha Tonka Spring—a scenic wonder that attracts more than one quarter million people each year. Lost to the plow is an irreplaceable tallgrass prairie near Prairie State Park, which should have been added to the park. Hundreds of leaky lead-acid batteries were dumped beside a sinkhole directly over Rock Bridge Memorial State Park's delicate Devil's Icebox cave system. An estimated \$10,000 worth of yellow coneflowers, a species whose worldwide range is limited to the Ozarks, was systematically stolen from glades throughout Ha Ha Tonka State Park. An entire lake at Knob Noster State Park was rendered unfishable because of chlordane contamination from improper spraying upstream, and an entire stream at Rock Bridge Memorial State Park was sterilized by an accidental upstream ammonia nitrate discharge. An amusement park opened opposite St. Francois State Park's entrance, and blasts the nearby campground with music loud enough to be heard in its wilderness backcountry camps two miles away. Burfordville Covered Bridge shifted on its abutments due to development-induced river flooding. The point made here is that natural environments and cultural resources are startlingly fragile, and constantly at risk.

Also while this was happening, science was changing from studying isolated species and habitats to understanding communities and ecosystems. In terms of managing state parks as natural preserves, Missouri's park system often led the way. And within a matter of years, it passed successively through a series of phases from inventory, preservation by designation, and experimentation to demonstration. It now stands at the threshold of implementing large-scale, comprehensive restoration and preservation programs.

Therefore, in focusing heavily on visitor facilities and amenities, the park system has only partly resolved the problems that the sales tax was intended to solve. But, how safe are the other assets of Missouri's state parks? The next important phase must attack the very complex array of threats and

Paul Nielson



The "elephants" at Elephant Rocks State Park are one of Missouri's geologic wonders, and are a well known scenic and photographic landmark. Vandalism like this, and its many other variants, exact heavy tolls in terms of both park operations and visitor experiences.

Nick Decker



Few parks are large enough to control their own scenery or watersheds, so urban encroachment, such as this subdivision that is expanding around Rock Bridge Memorial State Park, becomes very significant. A majority of the threats reported in all eight categories can be traced to development near park borders.

ROCK BRIDGE MEMORIAL STATE PARK

Rock Bridge Memorial State Park, received as a gift in 1967, now includes nearly 2,300 acres of rolling land in Boone County, southeast of the growing city of Columbia. The primary attraction for park visitors is Devil's Icebox Cave and a natural rock arch known locally as Rock Bridge. In addition, the park contains the 700-acre Gans Creek Wild Area.

For more than two decades, geologists, naturalists, and park officials have recognized the urgency of threats from suburban development on land adjacent to the park. The Devil's Icebox and the Rock Bridge formed in an extensive sinkhole plain, which provides direct portals to the ground water, make this landscape particularly vulnerable to pollution from human waste and effluents that seep through the ground into a complex network of underground streams and small springs. As pressure for commercial and housing development in this beautiful area conveniently close to Columbia mounts, the danger to the ecosystem intensifies.

The Department of Natural Resources has taken numerous actions to ensure preservation of the underground formations and the wild and scenic areas at Rock Bridge. A large-scale trail reclamation project has improved access to Devil's Icebox and the Rock Bridge, while controlling the damage caused by visitors to fragile plant colonies, soil, and rock surfaces. Since 1974, several tracts adjacent to park boundaries have been

purchased to protect the park's natural features. While officials are aware of the desirability of acquiring all the land underlain by the underground water system that feeds into Devil's Icebox Cave, this has not been economically feasible. Attempts to persuade Boone County officials to restrict development in the area have met with limited success.

In 1985, a major ammonia nitrate spill occurred at Williams Pipeline Company just outside of the park, causing a major fish kill in Gans Creek. Other aquatic life was affected. A \$25,000 award was used to initiate a study of the damage to aquatic organisms. Unfortunately, lack of background quantitative research documenting the aquatic organisms originally occurring here meant that there was some conjecture and speculation regarding actual loss of species and aquatic ecosystem disruption. The threat of future spills remains.

Other threats to park resources include power, water, road, and pipeline corridors and rights-of-way, which run through and adjacent to the park disrupting the setting and fragmenting the landscape. Liquid and chemical spills along the highway, which then enter the park's watershed, have been serious problems in the past. Private property boundaries protrude into the park and create management problems. The park horizon is brightened each night with the lights of the city of Columbia.

Historically the park's landscape was at least partly tallgrass prairie and this has been eliminated from the park and from the region for over fifty years. Bottomland forests were also common but natural regeneration is prohibited by non-native fescue, which was planted in its place. At least 50 percent of the park's landscape is undergoing undesirable regeneration of vegetation, which is further exacerbated by poor, histori-

cally eroded soils and exotic species. Many hundreds of acres of old fields dominated by exotic grasses will not regenerate to native vegetation naturally. Prolonged fire suppression has also changed the pattern of succession and caused a loss of species diversity from the remnant forests.

Poor land use upstream promotes erosion in the park. Park trails are eroding, particularly from unauthorized horse use in Gans Creek Wild Area. With so many access areas, visitor abuse is hard to control. One persistent problem is campfire scars throughout the park. Off-road vehicles and all-terrain vehicles have been seen in the park—these vehicles are not authorized to leave park roads. This area is also an attraction for visitors who collect and remove "interesting rocks" from park streams.

Rock Bridge Memorial State Park is in an urban setting and receives very heavy use for a park its size. The resulting management problems are compounded by numerous external threats and together require constant vigilance to protect this natural system along with its plants and animals.

Visitor impact must be controlled and boundaries of the park should be expanded to protect the natural system that, over thousands of years, has created a unique landscape.

31 Threats - Rock Bridge Memorial State Park

67

AESTHETIC DEGRADATION

Mineral Survey/Dev./Extraction	
Timbering	
Grazing or Agriculture	
Forest Disease/Pest Infest.	
Land Development	H
Utility Corridors	M
Roads or Railroads	H
Inholdings	H
Urban Encroachment	H
Overcrowding/Vandalism	M
Lighting Interference	M

AIR POLLUTION

Industrial/Commercial Emission	
-Smoke	
-Dust	
-Chemicals	
-Visibility	
Area Emissions	
-Residential	
-Wind blown dust	
-Odors	
-Aerial spraying	
Transportation Emissions	
Indoor Air Pollution	
-Radon gas	L
-Asbestos	
Acid Rain	

ECOSYSTEM DEGRADATION

Changing Land Use in Area	H
Disruption of Natural Processes	
Exotic Encroachment	M
Undesirable Succession	H-H
Animal Overpopulation	L
Inadequate Size	H
Loss of Natural Diversity	

PARK OPERATION

Road/Utility Corridors	
Trails	M
Facilities	
Research	
Fire Protection	
Misuse of Chemicals	
Lack of Employee Knowledge	
Political Pressure	
Alteration of Historic Bldgs.	

EXOTIC ENCROACHMENTS

Animals	
Plants	
Unnatural Fires	
Unnatural Weather	
Noise	
-Motor Vehicle	
-Aircraft	
-Industrial	
-Visitor	
Blasting/Sonic Boom	
People (Squatters/Solicitors)	

PHYSICAL LOSS OF RESOURCES

Logging	
Mineral Extraction	
Hunting/Poaching	L
Fishing	
Commercial Plant Collection	M
Grazing	
Berry, Fruit, or Nut Collecting	
Specimen Collecting	M
Soil Erosion	H
Salvage After Natural Disaster	
Archaeological Collecting	L
Deterioration of Historic Fabric	H

VISITOR PHYSICAL IMPACT

Campfires	L
Trampling	
Erosion	M
Wildlife Harassment	L
Habitat Destruction	
Mountain Bikes/Trail Bikes	
Horses	M
ORV/ATV Use	L
Subtle Influences	

WATER QUALITY CHANGES

Chemical	H
Sewage	H
Sediment	L
Thermal	
Unnatural Flooding	
Flow Decrease	M
Spills	H
Radioactivity	
Acid Mine Drainage	